

MICROBIOLOGY FOR SCIENCE MAJORS – BIOL 2421
SPRING 2017

Instructor: Dr Crystal Kelehear Graham, Assistant Professor
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Office Hours: 11:00-12:00 M, W | 14:00-16:00 Tu, Th | & by appointment

Lecture: 12:30-1:45 PM Tu, Th | WSB 201

Required Text: Madigan et al. 2015. Brock Biology of Microorganisms. 14th Edition. Pearson.

Course description:

This course will focus on microorganisms and how they impact our everyday lives. As an introductory course in Microbiology, the focus will be on the ubiquity, diversity and evolution of microorganisms, microbial ecology, and medical microbiology. Genetics, genomics and molecular biology will receive less attention as these topics are covered in other courses.

Student Learning Outcomes:

The biology student graduating with a BS in Biology should be able to:

- 1) Demonstrate an understanding of evolution by natural selection.
- 2) Demonstrate an integration of environmental awareness into everyday modern life.
- 3) Demonstrate an understanding of how to incorporate molecular biology into the study of the whole organism.
- 4) Demonstrate utilization of various field techniques toward addressing scientific questions in the discipline.
- 5) Conduct basic laboratory experiments utilizing standard observational strategies.

Student Learning Objectives for this Course:

- 1) Students will outline the differences between prokaryotes and eukaryotes
- 2) Students will demonstrate an understanding of microbial growth, nutrition and metabolism
- 3) Students will demonstrate an understanding of microbial ecology and nutrient cycling
- 4) Students will outline the basic features of bacteria, archaea, fungi, algae, protists and viruses
- 5) Students will demonstrate an understanding of diseases caused by bacteria, fungi and viruses

Attendance:

Attendance is mandatory. Lectures will not be posted on Blackboard so students must attend lectures to receive the material. Absences are excused only if students have a documented, university approved excuse (death in the family, illness, etc.). As per SRSU policy, any students missing 20% (6 lectures) of classes over the course of the semester shall be dropped from the class with an F. **Students cannot miss exams** unless they have a documented, university-approved excuse; in these cases, the instructor needs to be informed **before** the day of the exam. **Do not miss lab practical exams** as they cannot be re-run.

Grading:

There will be three lecture exams, each of equal contribution to the student grade. Exams will cover the lecture material immediately preceding the exams *i.e.*, there will be no comprehensive final exam. Lecture examinations amount to 75% of the student grade, the remaining 25% of the grade comes from the laboratory exercises and examinations. Within the lectures there will be opportunities to gain extra credit by responding to instructor questions: students will be awarded a voucher worth 1/5 of an extra credit point each time they answer a question correctly in class. The vouchers quantify student participation in lectures. Vouchers can be redeemed in quantities of 5 for an extra point on the ensuing exam (submit your vouchers in quantities of 5 to the instructor as you hand in your exam).

Grades: A 90 – 100% B 80 – 89% C 70 – 79% D 60 – 69% F 0 – 59%

Class schedule (subject to change):

	Date	Topic	Textbook Chapter
<i>Week 1</i>			
Lecture 1	Tuesday, January 17	An Introduction to the Course + Microorganisms	1
Lecture 2	Thursday, January 19	Microorganisms & History of Microbiology	1
<i>Week 2</i>			
Lecture 3	Tuesday, January 24	Microbial Cell Structure & Function	2
Lecture 4	Thursday, January 26	Microbial Cell Structure & Function (continued)	2
<i>Week 3</i>			
Lecture 5	Tuesday, January 31	Microbial Metabolism	3
Lecture 6	Thursday, February 02	Molecular Microbiology	4
<i>Week 4</i>			
Lecture 7	Tuesday, February 07	Microbial Growth & Control	5
Lecture 8	Thursday, February 09	Metabolic Regulation	7
<i>Week 5</i>			
Lecture 9	Tuesday, February 14	Viruses	8-9
EXAM	Thursday, February 16	Exam I	
<i>Week 6</i>			
Lecture 10	Tuesday, February 21	Microbial Evolution	12

Lecture 11	Thursday, February 23	Diversity of Bacteria	15
Week 7			
Lecture 12	Tuesday, February 28	Diversity of Bacteria (continued)	15
Lecture 13	Thursday, March 02	Diversity of Archaea	16
Week 8			
Lecture 14	Tuesday, March 07	Diversity of Archaea (continued)	16
Lecture 15	Thursday, March 09	Diversity of Eukaryotic Microorganisms	17
<i>Spring Break</i>			
No Lecture	Tuesday, March 14	No classes – Spring break	
No Lecture	Thursday, March 16	No classes – Spring break	
Week 9			
Lecture 16	Tuesday, March 21	Diversity of Eukaryotic Microorganisms (continued)	17
Lecture 17	Thursday, March 23	Microbial Ecology	18-20
Week 10			
Lecture 18	Tuesday, March 28	Microbial Ecology (continued)	18-20
EXAM	Thursday, March 30	Exam II	
Week 11			
Lecture 19	Tuesday, April 04	Microbiology of the Built Environment	21
Lecture 20	Thursday, April 06	Microbial Symbioses	22
Week 12			
Lecture 21	Tuesday, April 11	Microbial Interactions with Humans	23
Lecture 22	Thursday, April 13	Immunity & Host Defense	24-25
Week 13			
Lecture 23	Tuesday, April 18	Diagnostic Microbiology	27
Lecture 24	Thursday, April 20	Epidemiology	28
Week 14			
Lecture 25	Tuesday, April 25	Bacterial and Viral Diseases	29-31
Lecture 26	Thursday, April 27	Bacterial and Viral Diseases (continued)	29-31
Week 15			
Lecture 27	Tuesday, May 02	Eukaryotic Pathogens	32
No Lecture	Thursday, May 04	No classes – Dead Day	
Week 16			
EXAM	Wednesday, May 10	(10:15 am-12:15 pm) Exam III	

Note – Lecture topics are subject to change according to course interest, organization, and timing constraints, however the exam dates will remain the same.

Students with disabilities will be provided reasonable accommodations. If you would like to request such accommodations because of a physical, mental, or learning disability, please contact the ADA Coordinator for Program Accessibility at 837-8203, FH 112.